Arctic Grayling Workgroup
March 1, 2005
Bozeman, Montana

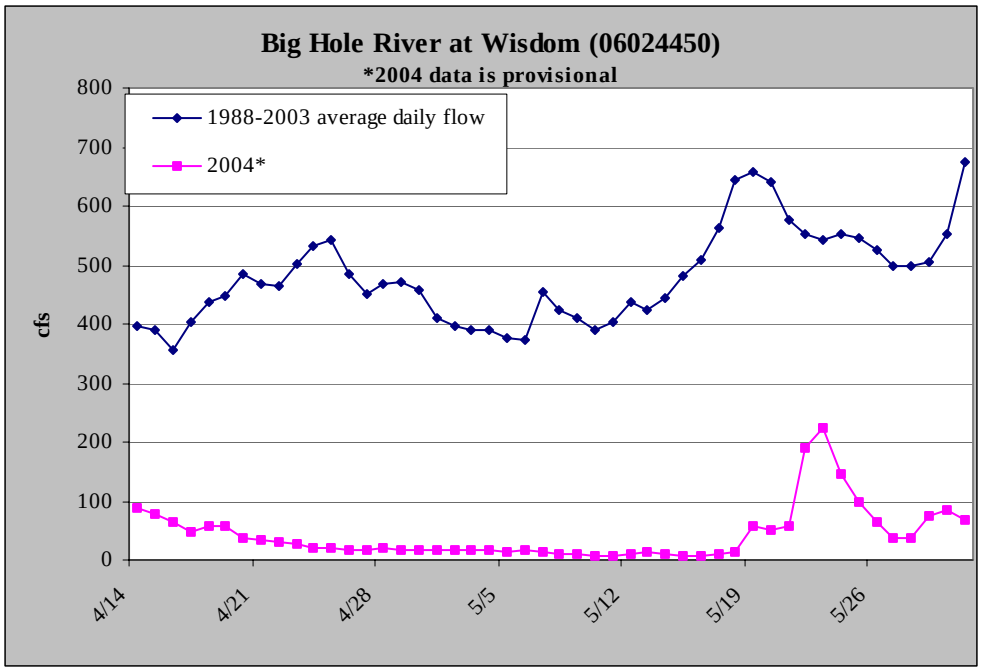
Introductions – Meeting was attended by 36 individuals representing FWP, USFWS, USFS, NRCS, MSU, TU, TEI, BHWG, BHWC, YNP, AFS

Upper Big Hole 2004 Water Management

- Wisdom – average precipitation is 12"
- Approx. 90,000 acres are flood irrigated for hay and pasture
- Claimed appropriations in the Big Hole = 1,600 cfs
    - Big Hole + Tribs = 4,300 cfs
- Upper wetted-P is 160 cfs at Wisdom Bridge
- Lower wetted-P is 60 cfs at Wisdom Bridge
- Short-term survival level is 20 cfs at Wisdom Bridge

- What happened in 2004?
    - Typically peak flow is early April – in 2004 we were at 74% of normal
    - Irrigation began 1 to 1.5 months early
    - Flows declined to less than 10 cfs; down to 6 cfs on May 10
    - Land use has shifted from predominantly hay to more pasture
    - Threat of Emergency Listing
    - NRCS EQIP provided funds to pay irrigators to NOT irrigate
        - Goal was to increase flows to >20 cfs
        - This was a 1-year plan; a band-aid
        - Paid $800,000 to cease irrigation to 16 landowners incorporating 15,000 acres; 49 headgates were adjusted – involved numerous groups to administer. Ditch rider was hired to assist.
            - June 21 –10 headgates were closed/adjusted
            - June 28 – 27 headgates adjusted/closed
            - July 5- 11 headgates adjusted/closed
        - Became obvious that many headgates couldn't be totally shut down. There were many inefficiencies that were observed.
        - Compared to 1988 to present; 2004 water year resulted in:
            - Lowest peak on record
            - 3rd lowest volume April 1 to October 1
            - Lowest runoff volume May 1 to July 15

    - Equip program, in conjunction with spring precipitation appears to have resulted in flows at Wisdom bridge avoiding going below 20 cfs. Resulted in much better relations between landowners and management/ conservation agencies.



o

History of Grayling Workgroup

- Early 1980s - Yellowstone Park asked for grayling eggs - state said to get them from the Big Hole
- 1983 – state biologists surveyed and realized there was a problem
- 1989 – workgroup formed
- 1990 – FWP indicated there were no funds, and grayling were on their own
- TU put up a $5,000 challenge for grayling conservation
- FWP, BLM, USFWS, USFS contributed, and the Arctic Grayling Recovery Program formed
- 1991 – Listing petition; Recovery program hired Pat Byorth as the Grayling Biologist
- Started the brood stock population that could be used for reintroduction efforts
- 1994 - USFWS came out with warranted but precluded due to plan; goal was set of 5 distinct populations

- Kaya initiated behavioral studies
- Byorth started looking at competitive interaction studies (rainbows, browns, grayling)
- Habitat and water conservation work began
- Late 1990s – Jim Magee replaced Byorth; shifted from a research to reintroduction emphasis
- Restoration Plan was developed and signed in 1996
- MOU was initially signed in 1991, it was re-upped in 1996, and again in 2001. Restoration Plan in 1995; FWS-FWP MOU in 1996.

- If there is a downside, it is that we haven't done a great job of getting the word out.

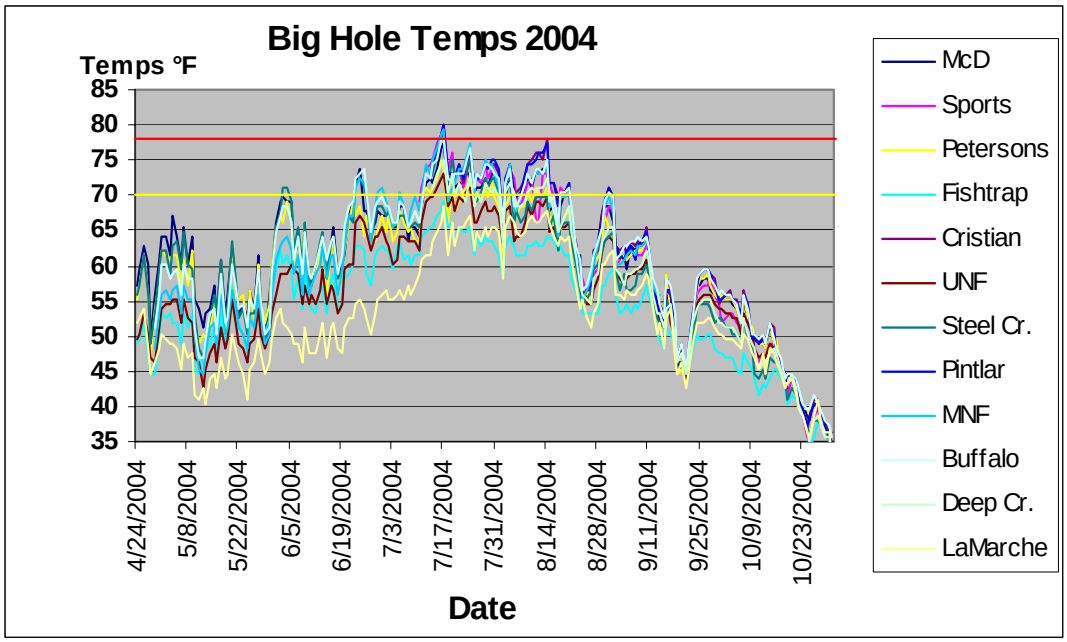
ESA Status

- Petitioned in early 1991; Warranted but precluded in 1994, meaning there is sufficient evidence to support listing, but listing is precluded by higher priorities. Efforts of the workgroup are a major reason why listing was precluded.
- May 2003, Plaintiffs sued USFWS for continued warranted but precluded
- Case is being heard in D.C. District Court – currently in 3 rounds of briefings (ends at the end of March). Three issues:
  - Whether the USFWS is making expeditious progress towards removing grayling form Candidate list
  - FWS has not justified continued candidate status
  - On-the ground status of grayling
- 2003 – Candidate status was upped from a 9 to a 3 – the highest it can get
- Judge wants to know why FWS is acting or not acting on grayling relative to other Candidate species. Why has grayling remained on candidate list when other species not on the list, or not on the list as long, have been addressed.
- Currently the discussion is based only on the fluvial component
- USFWS proposed to Plaintiffs to complete a 12-month finding by April 2006, with potential listing by April 2007. Plaintiffs rejected this as being too far out. USFWS is considering proposing earlier dates.

2004 Monitoring Efforts

Big Hole Fish Monitoring

- 14 Thermograph Stations, 3 USGS gauges
- In 2004, peak spawning correlated with low flows in April-May
- Nearly all monitoring stations got above 70 degrees, which is stressful to grayling;
- Lamarche and Fishtrap Creeks remained below 70 ^{o} the whole summer



- During the latest drought (since 2000), there have been on average 40+ days greater than 70 ^{o}; there were 20 days greater than 70^{o} in July 2004 and 12 in August.
- Changed the ways surveys have been done in the past few years, from Mark-Recapture to one-pass surveys (due to access, to minimize handling, and to get a broader scale on what is happening with grayling).
- Looking for stability of age classes across the monitoring reaches. In 2003 there was a bumper YOY year class; didn't see that in 2004.
- Length frequency skewed towards age zeros, primarily in a few streams like LaMarche and Fishtrap Creek. Looks like the 2003 age class fish moved into age ones – probably as a result of the water from the EQIP and precipitation.

Fig. 2. Big Hole Grayling Catch Per Unit Effort

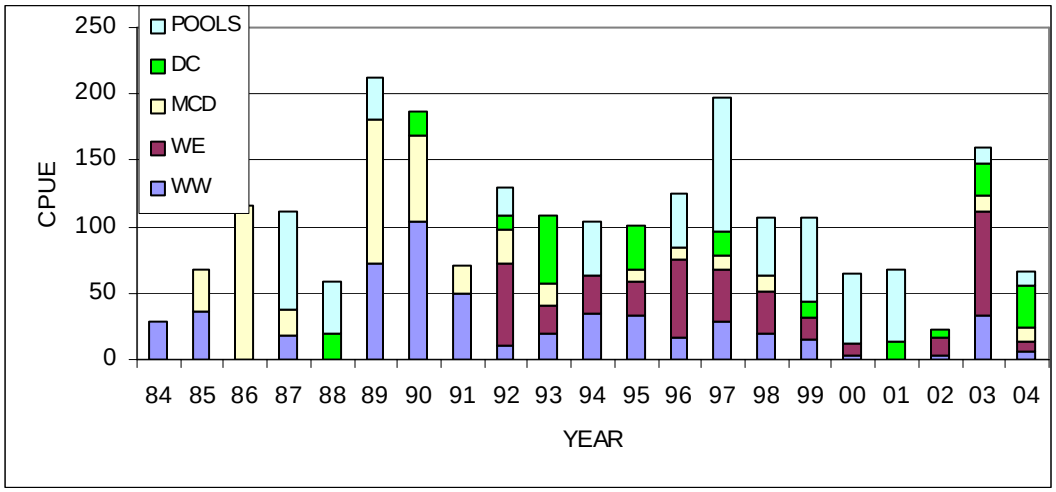
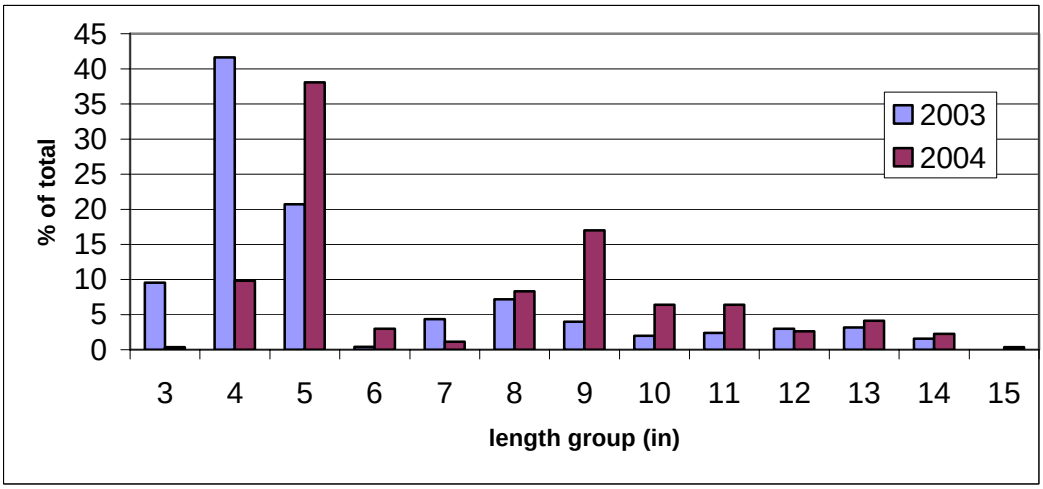


Fig. 3. Big Hole Grayling Length Frequency



Habitat

- Habitat projects occurring include providing passage over 4 pin and plank structures, riparian vegetation restoration in Steel Creek – have seen a tremendous improvement over the past year. Built pools in Fish Trap Creek;

Brood Lakes

- 186 females were spawned at Axolotl Lake produced 300,000 eggs
- 42 females spawned at Green Hollow produced 67,000 eggs
- Stocked 250-500 fish for future brood stock

Restoration Program

Sun River

- 1999-2001 – planted >35,000 grayling in the North and South Forks of the Sun – most went into Gibson Reservoir
- In 2004 – shifted to using remote site incubators in the North Fork Sun – packed in 12,000 eggs in 10 incubators. Had 90+ percent survival of eggs to fry. Goal is to use 40,000-50,000 eggs in 30 incubators in 2005.

Ruby River

- 28,000 age-1 grayling planted in 2004 + 1500 age-1
- Started big plants of around 30,000 grayling beginning in 2003. Prior to that, fewer numbers were stocked, and they were more spread out.
- Idea is if we plant more, larger fish, there should be more that survive to age 3 to reproduce.
- Brown trout may be limiting grayling in the lower reaches of the Ruby
- Used 22 incubators to incubate 36,000 eggs (1400-2800 eggs/incubator vs. 5,000/incubator last year (2003))
- Appears that a few grayling from RSIs in 2003 survived overwinter; and numerous grayling from 2004 RSIs were captured in the Fall.
- Also appears that there was pretty good survival of stocked fish.
- 4 year classes of grayling currently in the Ruby at high densities
- For first time, we have a substantial number of grayling in Ruby Reservoir this year following the saturation stocking of grayling in the Ruby. Perhaps we are reaching something like a carrying capacity in the river.
- Native whitefish and cutthroat seem to be abandoning the upper reaches of river; grayling were not.

Missouri Headwaters

- Planted 32,400 seven inch fish in 2004 – appear dispersed in Madison River and concentrated in hotspots in the Madison.
- Plan on stocking 20,000-30,000 in 2005

Beaverhead

- On hold due to poor water conditions

Candidate Conservation Agreement with Assurances

- FWP will hold agreement, and then issue Certificates of Inclusion to private landowners who agree to certain site-specific measures. Those measures will be negotiated with landowners through the development of site specific management plans.
- Develop site-specific plans with landowners with the goals of:
    - Improved stream flows – increased efficiencies, voluntary reductions in use, and water rights compliance
    - Improved riparian health – grazing plans and fencing
    - Improved stream habitat – linked to riparian health and flows; habitat improvement projects
    - Reduced levels of entrainment – fish screens – all ditches found to entrain 20 or more grayling will be either redesigned or fitted with an exclusion device (proposed)
    - Removal of migration barriers – unless it is acting to the benefit of other native species of concern (e.g., cutthroat) – installation of fish ladders
- In return, landowners get:
    - Regulatory assurances
    - Incidental Take Authorization
- Project Area: Upstream of Dickie Bridge = 387,200 acres; divided into 5 management segments
- Level of support already expressed by landowners is very high
- Proposed stream flow guidelines have been developed for each of the 5 segments
- Monitoring will be ongoing throughout life of the agreement

Approval Process

- Has to meet scientific rigor, legal rigor
- Has to go through NEPA and Section 7 analysis
- Standard of review: If done throughout the range of the species, it would preclude the need to list.

Revision of MOU and Restoration Plan

- Looking to get sub-committee to review that this year – Jim, Pete, Doug,

Grayling Symposium

- Big Hole Watershed Foundation recently received an 18-month planning grant from NRCS that includes education component on Arctic grayling recovery.
- Have $17,800 for this in the grant; Jim O'Neil has tentatively agreed to come down August 22-27. Foundation would like to have a scientific forum surrounding grayling and grayling recovery, and a public forum on grayling in the Big Hole = outreach.

- Science forum – suggestion that they sponsor the forum as part of the Western Division AFS – Summer 2006. Suggested that issues common to the Big Hole be looked at by any panel that is assembled: dams, thermal issues, dewatering, introduced species, reintroduction efforts (what works/doesn't work).
- Public forum – would include the CCAA partners and updates, and would likely be in the Big Hole.

- Looking for assistance from folks on the working group – Jim, Pete, Jeff Everett

Status of Broodstock

- Currently have three broodstocks: Axolotl, Green Hollow, and the Bozeman Fish Technology Center.
- Yellowstone River Hatchery - Jay Pravachek – FWP Big Timber Trout Hatchery Manager reports that they have the opportunity to house a grayling broodstock. Will be going to Axolotyl and Green Hollow, take eggs, and use those to start a broodstock. Will be able to ship eyed eggs, but not do production. Will be phasing out Bozeman FTC from a brood source to grayling research. Will hopefully infuse wild Big Hole genetics into the Big Timber broodstock if/when grayling rebound in the wild.
- FTC research – evaluate erythromyacin injections pertaining to BKD; different methods to reduce stress; use of ultrasound to determine which females are carrying eggs; look at different hormones to stimulate spawning in a shorter period of time and reduce handling and stress; look at different diets and cultural techniques.
- Agreement among the workgroup that the FTC fish will be experimental and available for research

2005 Work Plans

Montana Fish, Wildlife and Parks

I) **CCAA:** Work with interagency team and private landowners to implement CCAA Program in the Upper Big Hole River.

A) Submit CCAA Umbrella application to USFWS and follow through to approval.

B) Initiate Out Reach Program that garners support from individual landowners, interest groups and key parties that will benefit from CCAA program.

C) Work with multiple agencies to identify responsibilities, roles, funding commitments and complete schedule to initiate and complete specific tasks to progress CCAA efforts.

D) Aggressively pursue additional funding sources and opportunities to support on the ground CCAA efforts.

E) Initiate Site Specific Plans with interagency team that will progress with issuance of "Certificates of Inclusion" for individual landowners.

F) Design and implement a monitoring program that will encompass measuring species abundance, population demographics, flows, temperatures, riparian health and physical habitat conditions that will ultimately determine the success and of CCAA program.

II) Monitoring: Monitor the Big Hole River grayling population through spring, summer, and fall population surveys.

A) Initiate trapping of Big Hole tributaries to better define the role of tributaries to the Big Hole Arctic grayling population. Pursue genetic analysis of mainstem Big Hole grayling and tributary grayling to better understand meta- population dynamics of the Big Hole River grayling population.

B) Complete electrofishing surveys above and below installed fish ladders to assess efficiency of ladders for Arctic grayling and sympatric native and sportfish species.

C) Complete summer snorkel surveys to document important summer habitats and flow and temperature refugee under drought and thermally stressful regimes.

D) Complete fall population surveys in traditional sections (40 Bar, Wisdom, McDowell, Steel Creek, Deep Creek, the pools). Also complete surveys in reaches that will spatial assess population abundance and demographics in tributaries, side channels and mainstem reaches.

III) Broodstocks: Manage brood stock populations to maintain fluvial genetics, eliminate the risk of transferring pathogens to state and federal hatcheries or restoration waters, maintain adequate numbers of mature grayling that will provide gametes for restoration efforts. Collect gametes as needed for restoration efforts.

A) Investigate potential for establishing the Arctic grayling brood population at Big Timber State Fish Hatchery. MFWP biologists, state and federal hatchery mangers, MFWP Fish health staff and Rob Leary will review this proposal and make recommendation.

B) MFWP Fish Health staff will test brood stocks annually, prior to and/or during gamete collections.

C) Population abundance in brood lakes will be estimated through mark/recapture surveys. Low numbers of YOY grayling (250-500) will be planted annually to maintain multiple year classes.

D) Gametes will be collected in May at both to brood lakes and transferred to state hatcheries to eye up and transferred to remote site incubators or reared to age 1 grayling for restoration efforts.

IV) Outreach: Work with private landowners, the Big Hole Watershed Committee, the Big Hole River Foundation, Trout Unlimited, The Ruby River Water Council, Conservation Districts and other public interest groups to advocate enhancement of fisheries habitat conservation and the Arctic Grayling Recovery Program.

V) Habitat: Habitat enhancement projects to benefit the Arctic grayling population in the Big Hole River will be encompassed in the CCAA Program and include) Improving stream flow dynamics 2) Riparian health 3) Physical habitat 4) Fish passage and 5) Ditch entrainment.

A) Instream flows will be monitored in coordination with CCAA reaches and as need for site-specific plans for individual landowners. FWP will coordinate with DNRC to install Aqua Rods, True Tracts and measuring devices as needed.

B) Temperatures will be monitored at historic stations and expanded as needed.

C) Wetted Perimeter: Will be determined for CCAA reaches to better define flow goals.

D) Additional habitat enhancement projects will be most likely be coordinated by the CCAA process, however, will also be pursued outside CCAA Program scope. In 2005, we have received funding for two fish ladders, and a pool and riparian enhancement project.

E) We will establish a monitoring program measuring both pre and post conditions following habitat enhancement projects and the response by fish populations.

VI) Restoration Plan: Update 1995 Restoration Plan for fluvial Arctic grayling in Montana. Include updated habitat fish population, temperature and flow data.

VII) IV. Reintroductions

A. Plant Numbers for 2005:

- Bluewater State Fish Hatchery: 52,000, Origin Axolotl Lakes, Average
- length 8.7" June 1.

- Bozeman Fish Technology Center: Age 2: 1,500, Completed Brood; Average length 9.5"

B. Plant Locations:

- Ruby River: We will recommend yearling stocking rates depending on overwinter survival of 2004 plants with a maximum of 30,000. Surveys to assess survival will be completed in April 2005. Ruby will receive 1,500 age 2 grayling from BFTC and 60,000-eyed eggs for RSIs.
- North Fork Sun River: 30 RSI's and 45,000 eggs
- Lower Beaverhead River: No Fish
- Missouri River Headwaters: 22,000-52,000 Age 1, any surplus Fall YOY

C. Planting Schedule:

- Missouri Headwaters and Ruby River: yearlings; April/May 2005
- Ruby River Age 2 grayling from BFTC: June 2005
- North Fork Sun and Ruby River RSIs: May 20-June 15, 2005.

Ruby River:

We will continue to monitor survival of grayling planted into the upper Ruby River. We will conduct spring surveys to assess survival, movement, distribution, and spawning potential. We will continue fall electrofishing surveys in long-term survey reaches of upper Maloney, Greenhorn, Section One, Vigilante, Three Forks, and Headwater sections and others as needed to monitor grayling plants and rainbow, cutthroat, and brown trout populations. We will continue to use the voluntary creel to assess capture rates, species composition, distribution etc. We will continue to install RSIs with eyed eggs in the upper basin. We will monitor RSI success through out summer and fall. We will continue to track whirling disease and assist Dick Vincent as needed. A cooperative habitat enhancement project on the Turner Enterprises Inc. Snowcrest on willow Creek will began in spring 2005. Additional habitat enhancement project will be assessed and pursued as workload permits.

Sun River:

Objectives for 2005 are to 1) Continue with and expand RSI efforts 2) Assess survival of RSI produced grayling from 2004 3) Continue monitoring grayling in The North and South Forks, Gibson Reservoir and tributaries and Diversion Dam

to assess grayling survival, distribution and demographics and 4) Determine if any natural reproduction has occurred. To assess survival, distribution, growth, condition factor we will assist Region 4 personnel with spring surveys in Gibson Reservoir, Diversion Dam and electrofishing surveys at the mouths of the North and South Forks. We may snorkel reaches from Ray Creek to the Wilderness Boundary on the North Fork. We will further investigate Gibson tributaries as potential spawning and rearing habitats. Volunteer angler surveys will be continued. Thermographs will be deployed the North Fork.

Beaverhead River:

No Work is planned for the Beaverhead River due to predicted poor stream flow and temperature conditions that have persisted since 1999.

Missouri River Headwaters:

Yearling grayling will be planted in April of 2005 and plants will be concentrated in the Gallatin and Madison Rivers. We will monitor the previous plants with electrofishing surveys coordinated with Spoon and Tohtz (Area Management Biologists) as time and workload permits. Temperature and flow regimes will continue to be monitored at USGS sites.

Yellowstone National Park - initiating a graduate project on grayling in the Gibbon River to determine what is going on with Grayling there. Want to determine if there is a viable population of fluvial grayling there. Have tagged over 300 fish in Grebe and Wolf Lakes, and haven't found any of those in the river. The study area will be from headwater lakes down to the Firehole. Will be looking for tags, attempting to document spawning, and will be looking for fry. Also surveying the Gallatin – not finding many there. Continuing to evaluate the Gallatin headwater for reintroduction, but productivity is very low.

Red Rocks – USFWS is beginning work on a Comprehensive Conservation Plan for the refuge. NOI is scheduled to be published this year for Red Rocks. Fisheries issues will be incorporated in the plan. Will include an adaptive resource management plan for the lower lake to meet objectives for water levels with focus on waterfowl and trumpeter swans.

Budget - Staffing

- The grayling restoration program is cobbled together with funding from FWP, BLM, USFS, USFWS, PPL Montana, and TU.
- All agencies were reminded of the MOU to help fund grayling restoration efforts, and were strongly encouraged to work with their budgeting processes to ensure funding for the restoration program is maintained.

Other

- Questions were asked about the ESA status of adfluvial grayling – would they count or not. There are native populations in Red Rocks and Ennis, and potentially introduced populations in Gibson and Ruby Reservoirs. There was not an answer to this – but it is something that should be discussed and clarified.

- Question was raised whether there has been thought about what nonnatives might do if habitat and flows are improved to the point where nonnatives increase in numbers and distribution. It was stated that perhaps we need to make it clear right up front that if nonnatives expand to higher, unacceptable levels in the upper Big Hole, there will be active efforts to reduce or eradicate those nonnatives.

Next Meeting – **February 28, 2006**

List of meeting attendees on the next page

Meeting Attendees

March 1, 2005 Grayling Work Group Meeting

AGENCY	NAME	EMAIL	PHONE
MFWP	Ken McDonald	kmcdonald@mt.gov	444-7409
MFWP	Jim Magee	mageejames@mt.gov	683-2675
MFWP	Patrick Lamothe	plamothe@mt.gov	683-2675
USFWS	Jeff Everett	jeff_everett@fws.gov	727-7400 x31
MFWP	Melissa Frost	mfrost@montana.edu	994-6931
BHRF	Jeff Schahczenski	bhrf@ncat.org	494-8636
GGTU BHRF	Pat Munday	pmunday@mtech.edu	496-4461
BHWC	Noorjahan Parwana	nparwana@bhwc.org	782-3682
FS	Chris Riley	criley01@fs.fed.us	682-4253
USFWS	Yvette Converse	yvette_converse@fws.gov	587-9265 x128
FWS	Lynn Kaeding	Lynn_Kaeding@fws.gov	582-0717
FS	Scott Barndt	sbarndt@fs.fed.us	587-6711
TEI	Carter Kruse	ckruse@montant.net	556-8508
USFWS	Matt Toner	matt_toner@fws.gov	587-9265
AFS	Pay Dwyer	wdwyer6466@aol.com	587-0910
PPLMT	Brent Mabbott	lbmabbott@pplweb.com	533-3447
FS	Dan Downing	ddowning@fs.fed.us	689-3243
FWP	Pat Clancey	pcensfwp@3rivers.net	682-7807
FWP	Dick Oswald	fishfwpdillon@7pks.com	683-9310
FWP	Pat Flowers	pflowers@montana.edu	994-4050
NPS	Todd Koel	todd_koel@nps.gov	307-344-2281
FWP	Bruce Rich	brucer@montana.edu	994-3155
MSU	Amber Steed	asteed@montana.edu	994-3698
NPS	Dan Mahony	Dan_Mahoney@nps.gov	307-344-2280
FWP	Jay Pravecek	cuttsrus@mtintouch.net	932-4434
FWP	Wayne Sandmeir		932-4434
NRCS	Kris Berg	Kris.Berg@mt.usda.gov	683-3803
FWS	Glenn Boltz	glennbotlz@fws.gov	582-0717
Montana St U., retired	Cal Kaya	ubick@montana.edu	586-5376
USFWS	Jim Mogen	jim_mogen@fws.gov	582-0717
MTFWP	Dave Yerk	dyerk@3rivers.net	466-5621
Montana TU	Bruce Farling	montanatrout@montana.com	543-0054
	Buddy Drake	bdrake@montantdsl.net	388-1888
FWS	Doug Peterson	doug_Peterson@fws.gov	449-5225
FWP	Bob Snyder	bsnyder@mt.gov	444-1563
FWP	Lee Nelson	Leenelson@mt.gov	495-3866